

# Power Projects and Transactions: Tips and Traps

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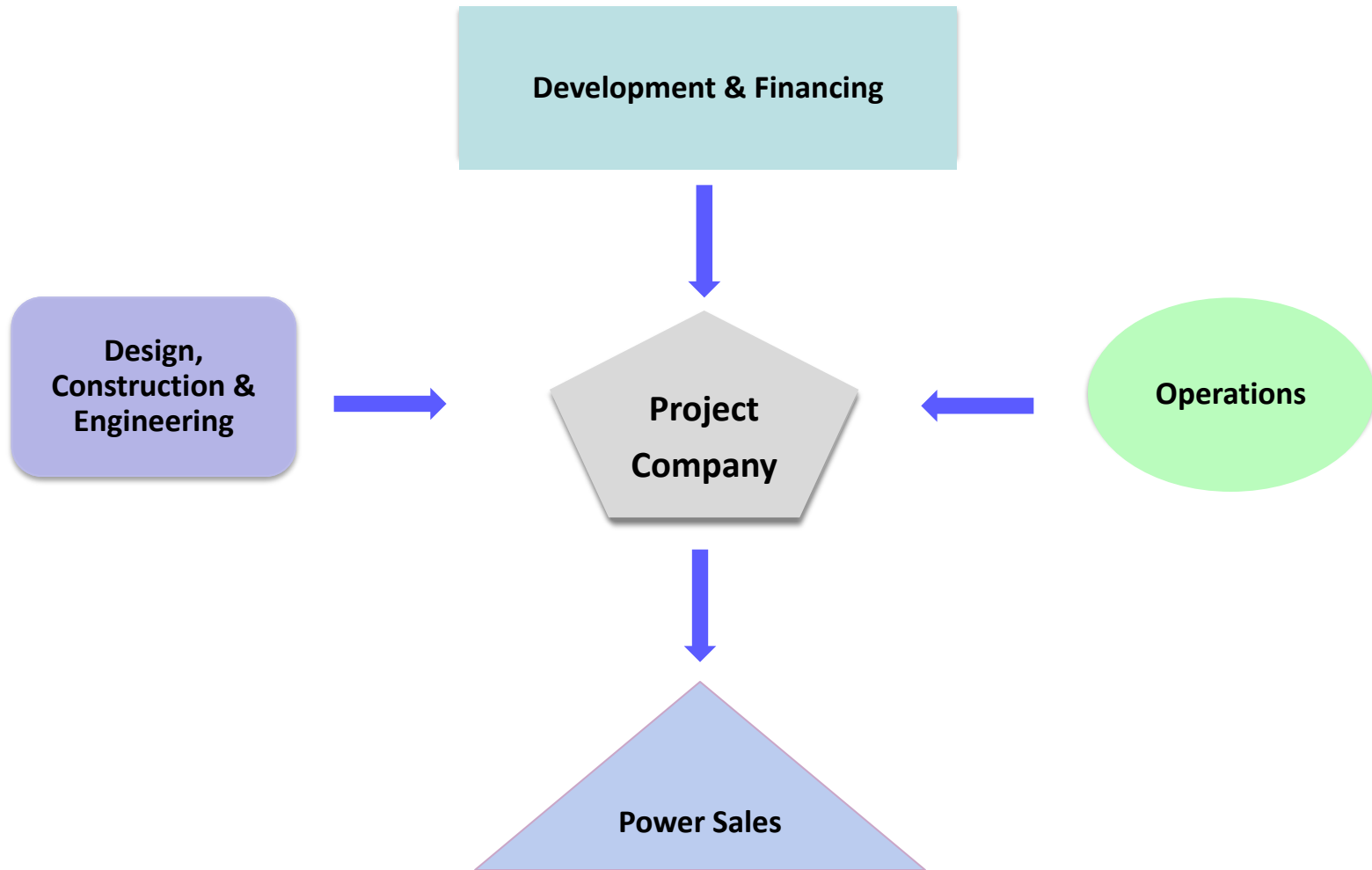
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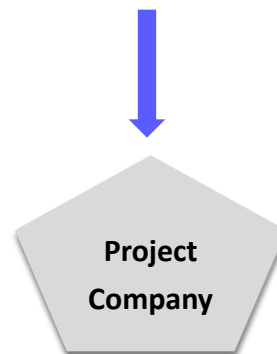
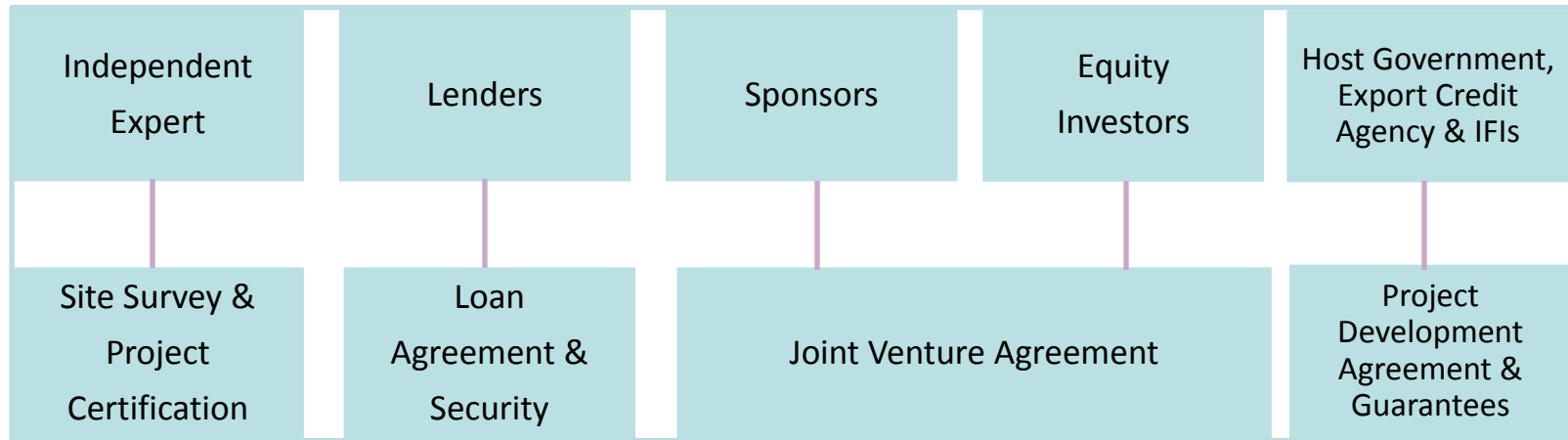
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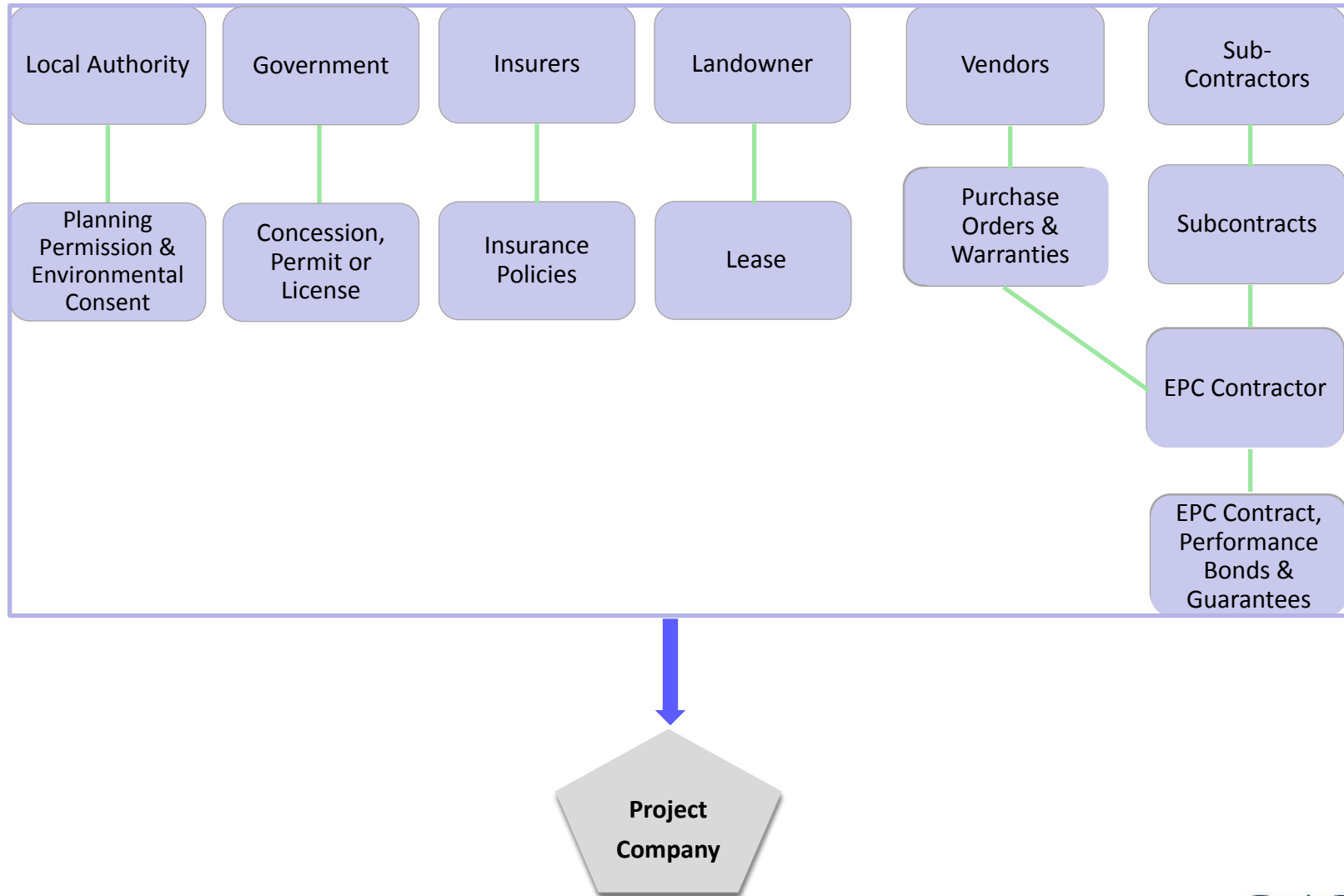
# Project Structure



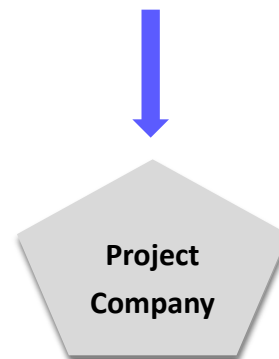
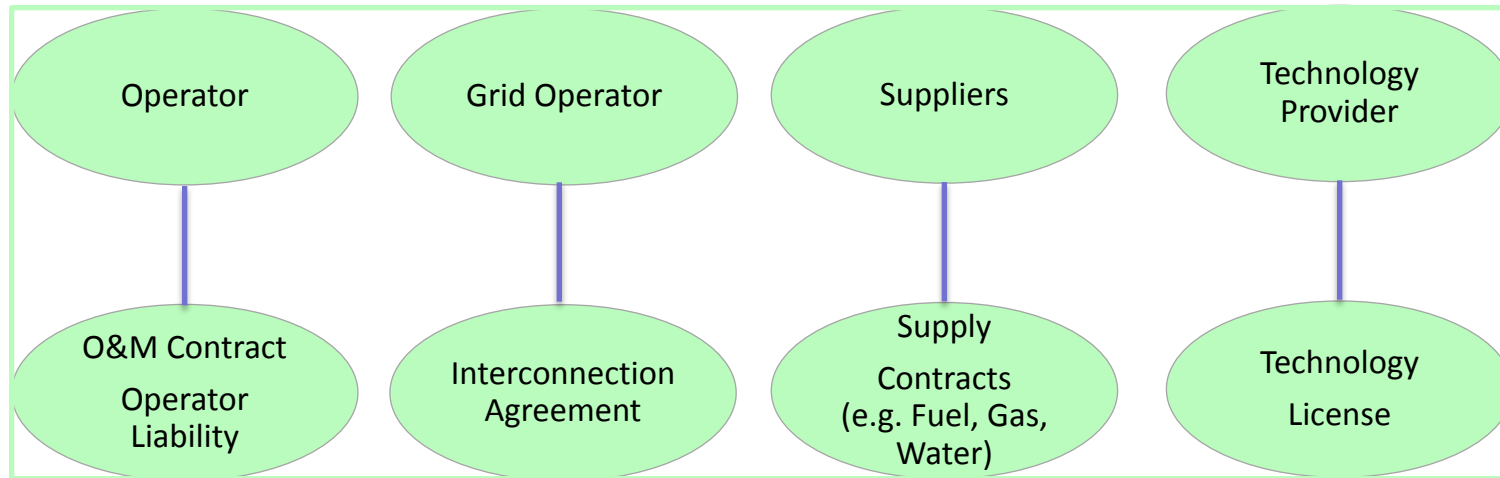
## Development & Financing



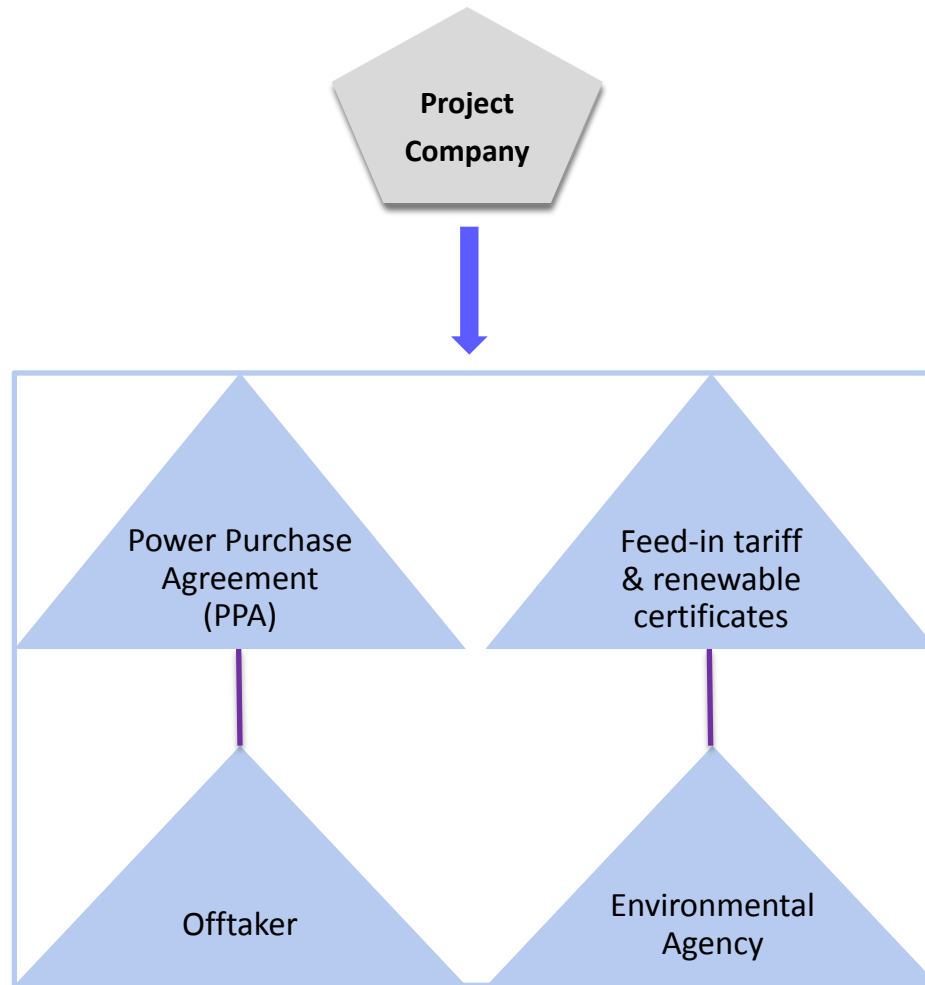
# Design, Construction & Engineering



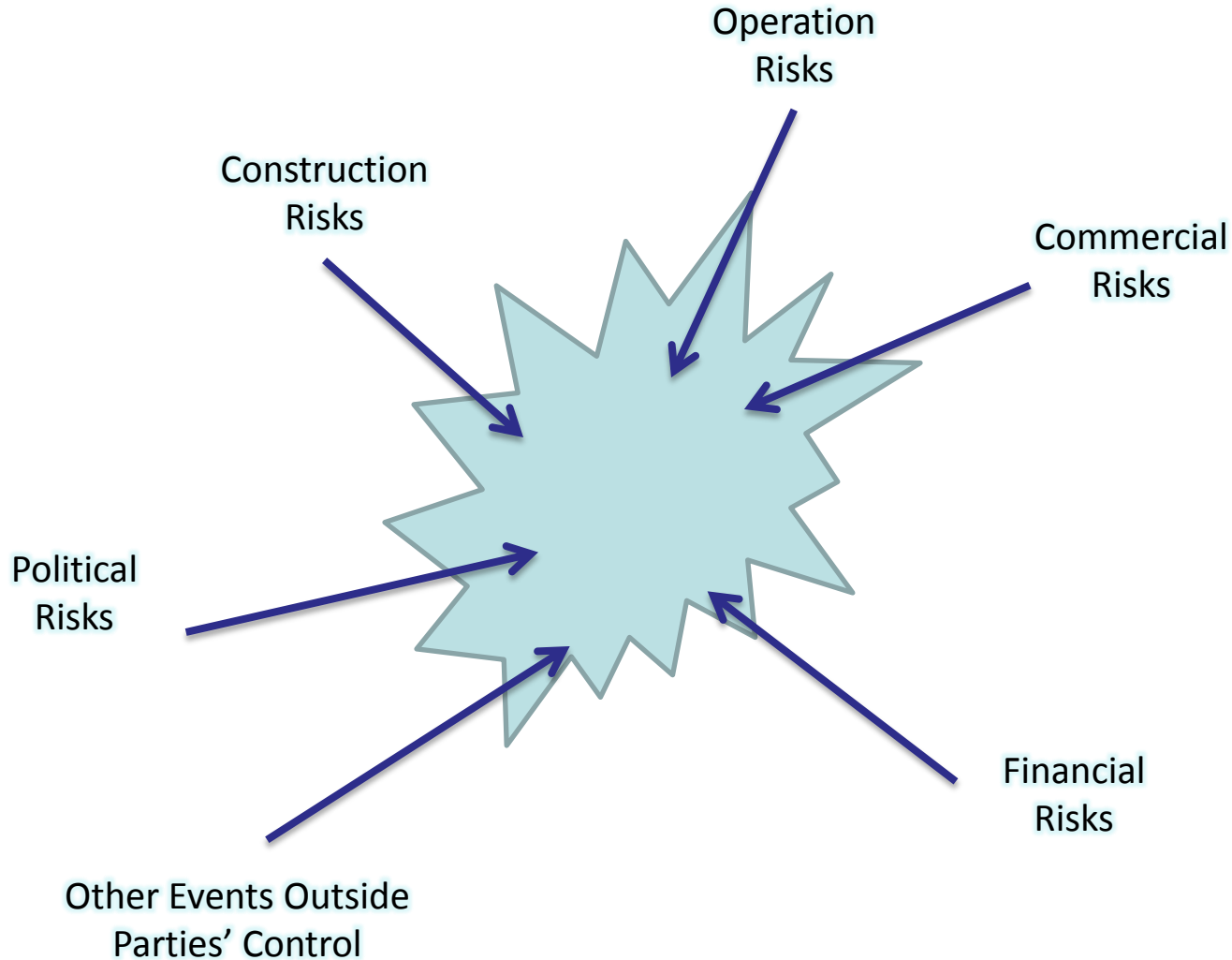
# Operations



# Power Sales

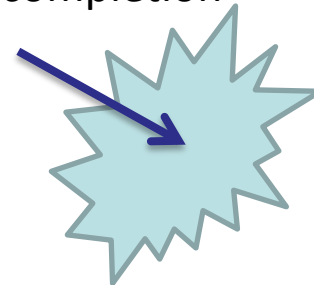


# Risks



## Construction Risks

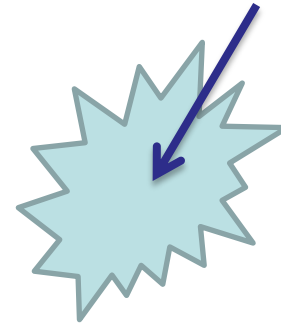
- Risk that facility cannot be completed or cannot be delivered according to agreed schedule (completion risk)
- Risk that construction cost exceeds original estimates (construction cost overrun risk)
- Risk that facility fails to meet performance criteria at completion (performance risk)





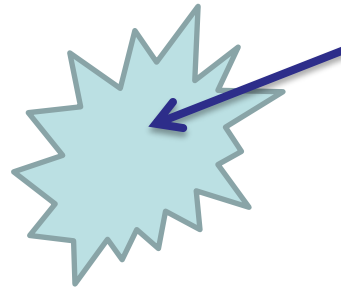
## Operation Risks

- Risk that facility cannot be effectively operated or maintained to produce expected capacity, output or fuel efficiency / heat rate (performance risk)
- Risk that operating costs exceed original estimates (operation cost overrun)



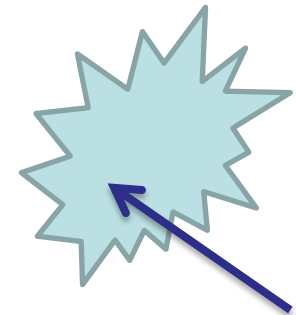
## Commercial Risks

- Risks that project cannot generate expected revenue because of changes in market prices or demand for power
- Risk that project company or power purchaser becomes insolvent or bankrupt



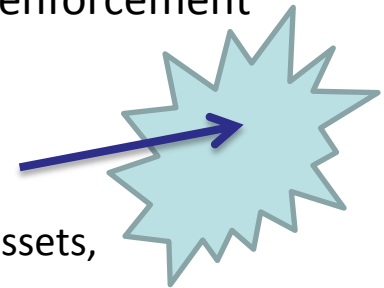
## Financial Risks

- Risk related to value, convertibility and transferability of local currency
- Foreign exchange rates can affect project cash flows (e.g. prices charged to local offtaker can be paid for in local currency, while loan facilities and sometimes equipment and fuel costs may be denominated in foreign currency)
- Foreign exchange controls or lowering reserves of foreign exchange may limit availability in local market of foreign currency needed to service debt
- Risk that interest rate may rise, forcing project to bear additional financing costs



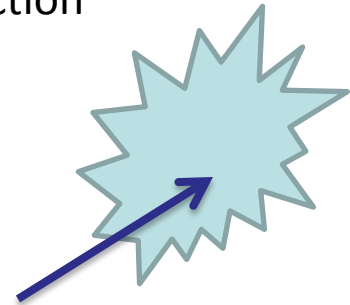
## Political Risks

- Among the most important, yet difficult, risks to assess and mitigate
- Include adverse actions of host government, its agencies or its legislature, in particular in granting licences or permits, adopting regulations applicable to project company and its markets, taxation and performance and enforcement of contractual obligations
- Can be divided in 3 categories:
  - Traditional political risks (e.g. nationalization of project company's assets, imposition of new taxes)
  - Regulatory risks (e.g. introduction of more stringent standards for service delivery)
  - Quasi-commercial risks (e.g. breaches by contracting authority or changes in contracting authority's priorities and plans)
- Political risks may also result from acts of foreign governments (other than host government), such as blockades, embargoes and boycotts imposed by governments of investors' home countries



## Other Events Outside Parties' Control

- May be of a physical nature, such as natural disasters (e.g. floods, storms, earthquakes) or the result of human action (e.g. war, riots, terrorist attacks)
- May cause temporary interruption of project execution or operation of facility, resulting in construction delay, loss of revenue and other losses



# Risk Management



## Need to Mitigate / Allocate Risks

- Some risks can be covered by insurance or guarantees of IFIs, export credit agencies or host governments
- Adequate risk allocation essential to reducing project costs and ensuring successful project
- Risk allocation refers to determination of which party should bear the consequences of project risks
- Need to reconcile diverging interests of stakeholders
- Allocation determined after consideration of number of factors, e.g. public interest in development of project, level of risk faced by project company, investors, lenders, etc.
- Identification, assessment, allocation and mitigation of risks is at heart of project financing

## General Principles for Risk Allocation

- Risks should normally be allocated to party best able to assess, control and manage them
- Risks should be allocated to party with the best access to hedging instruments
- Risks should be allocated to party with greatest ability to diversify risks or mitigate them at lowest cost
- Important to consider financial strength of party to which a specific risk is allocated and its ability to bear consequence of risk
- In practice, risk allocation often a factor of both policy considerations and parties' negotiating strength

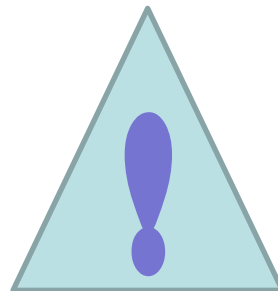


## General Principles for Risk Allocation (*continued*)

- Project company and contractors usually assume risks related to design, development, construction and operation of plant
- Completion, cost overrun and other risks of construction phase typically allocated to construction contractor under turnkey construction contract
- Contracting authority may be expected to bear consequences of disruptions caused by acts of government
- Obtain assurances against expropriation or nationalisation and guarantees that proper compensation will be payable in the event of such action
- No single solution to cover risks that may result from events outside the control of the parties (e.g. war, civil disturbance, natural disaster)

## Five Key PPA Clauses

1. Pricing Clause
2. Take-or-Pay Clause
3. Liquidated Damages / Penalty Clause
4. Force Majeure Clause
5. Green Credit (Certificate) Clause



## Pricing Clause

- Power prices may be fixed, may have fixed escalation rate, may be set to escalate with inflation factor, interest rate or other index (e.g. fuel price index)
- Beware as power prices are volatile (price linked to index can be dangerous for seller if prices decrease / for buyer if prices increase)
- Important to seller to provide for floor price and for buyer to provide price cap
- Seller should protect against changes in law (e.g. introduction of new taxes, cap-and-trade regulations for carbon emissions)
- Aim is to protect real value of revenues from increased costs of operating plant

## Pricing Clause (*continued*)

- Price often based on actual consumption or electrical output (energy charge) and available capacity (capacity charge)
- Capacity charge generally designed to cover project company's fixed costs
- Energy charge generally designed to pay for cost of project company's fuel and other variable costs
- Capacity charge and energy charge together constitute contract charge
- Charging mechanism is generally pass-through arrangement

## Pricing Clause (*continued*)

- Basic formula for **capacity charge** for any period:
  - $FC \times \frac{AA}{TA}$
  - FC: project company's fixed costs for such period
  - AA: actual availability achieved by project company for such period
  - TA: target availability for such period under PPA
  - Fixed costs typically include amounts due under bank loans, depreciation, O&M costs, insurance premiums, administrative overheads, return on equity, etc.
  - Availability: ability (measured in MWh) of power plant to generate electricity over time (function of time and declared capacity)

## Pricing Clause (*continued*)

- Basic formula for calculating **energy charge** for any period:
  - $VC \times \frac{AE}{TE}$
  - VC: project company's fuel and other variable costs for such period
  - AE: actual efficiency achieved by project company for such period
  - TE: target efficiency for such period under PPA
  - Efficiency: rate at which fuel is converted into electrical power, expressed in kcal/kWh
  - Efficiency can be affected by poor maintenance or use of fuel which does not comply with specifications
  - Efficiency targets intended to ensure that project company maintains plant properly and purchases fuel within specification

## Take-or-Pay Clause

- Project financing requires relative certainty concerning projected revenues
- Take-or-pay clause guarantees minimum revenues to power producer
- Purchaser agrees to purchase over a specified period a minimum quantity of power at an agreed price
- If purchaser does not purchase (or “take”) minimum quantity, it must still pay as if it had (but usually only if project company was able and willing to deliver power)
- Precise nature of take-or-pay arrangement varies from contract to contract
- Depending on jurisdiction, watch out for arrangement not to be assimilated to penalty and be void
- Purchaser’s right to curtail normally limited to force majeure events and system emergencies

## Liquidated Damages / Penalty Clause

- In consideration, power purchaser may impose minimum delivery obligations
- PPA will typically require power producer to pay LDs if it fails to deliver power as promised due to underperformance or delays
- Project company will similarly pass on risk to construction company
- Construction company typically liable to pay liquidated damages for late completion or non-performing plant
- Payment of purchase price by purchaser (power) and LDs payable by seller (failure to deliver) often backed by standby letter of credit or performance guarantee
- LDs generally not payable if failure to perform due to force majeure



## Force Majeure Clause

- Anything but standard / highly negotiated
- Can make difference between life or death of power producer or purchaser
- Parties should not simply rely on applicable substantive law
- Some force majeure events more difficult to agree on (e.g. equipment breakdown, failure of subcontractor, labour disputes, change in law)
- Lack of funds typically not constitute force majeure
- Breach of contract, force majeure and termination clauses intimately linked – need to be thorough (termination clause referring to “... breach of obligations...” will likely not apply, while termination clause referring to “... failure to perform...” could apply)

## Green Credit (Certificate) Clause

- Green / carbon credits or renewable energy certificates (RECs) represent environmental attributes of electricity produced from renewable sources
- Credits can incentivize carbon-neutral renewable energy by providing production subsidy to electricity generated from renewable sources
- Credits can be sold separately from electrical power and can be important source of revenue
- Ownership of revenues related to credits must be allocated between parties
- Credits do not always automatically belong to project company
- PPA should explicitly spell out credit ownership

Thank you!

